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Michael Mitzenmacher

August 2001 **Proceedings of the twentieth annual ACM symposium on Principles of distributed computing**Full text available:  pdf(584.99 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

A Bloom filter is a simple space-efficient randomized data structure for representing a set in order to support membership queries. Although Bloom filters allow false positives, for many applications the space savings outweigh this draw-back when the probability of an error is sufficiently low. We introduce *compressed Bloom filters*, which improve performance when the Bloom filter is passed as a message, and its transmission size is a limiting factor. For example, Bloom filters have bee ...

2 Performance and reliability analysis of relevance filtering for scalable distributed interactive simulationMostafa A. Bassiouni, Ming-Hsing Chiu, Margaret Loper, Michael Garnsey, Jim Williams
July 1997 **ACM Transactions on Modeling and Computer Simulation (TOMACS)**, Volume 7 Issue 3Full text available:  pdf(499.11 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Achieving the real-time linkage among multiple, geographically-distant, local area networks that support distributed interactive simulation (DIS) requires tremendous bandwidth and communication resources. Today, meeting the bandwidth and communication requirements of DIS is one of the major challenges facing the design and implementation of large scale DIS training exercises. In this article, we discuss the DIS scalability problem, briefly overview the major bandwidth reduction techniques c ...

Keywords: bandwidth reduction, distributed interactive simulation, real-time protocols, scalable algorithms

3 Summary cache: a scalable wide-area web cache sharing protocolLi Fan, Pei Cao, Jussara Almeida, Andrei Z. Broder
June 2000 **IEEE/ACM Transactions on Networking (TON)**, Volume 8 Issue 3Full text available:  pdf(220.29 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: ICP, Web cache, Web proxy, bloom filter, cache sharing

4 Message files

Dennis Tsichritzis, Stavros Christodoulakis

January 1983 **ACM Transactions on Information Systems (TOIS)**, Volume 1 Issue 1

Full text available:  [pdf\(592.55 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)



5 Efficient filtering in publish-subscribe systems using binary decision diagrams

Alexis Campailla, Sagar Chaki, Edmund Clarke, Somesh Jha, Helmut Veith

July 2001 **Proceedings of the 23rd International Conference on Software Engineering**

Full text available:  [pdf\(225.86 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

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Implicit invocation or publish-subscribe has become an important architectural style for large-scale system design and evolution. The publish-subscribe style facilitates developing large-scale systems by composing separately developed components because the style permits loose coupling between various components. One of the major bottlenecks in using publish-subscribe systems for very large scale systems is the efficiency of filtering incoming messages, i.e., matching of published events w ...

6 Improving end-to-end performance of the Web using server volumes and proxy filters

Edith Cohen, Balachander Krishnamurthy, Jennifer Rexford

October 1998 **ACM SIGCOMM Computer Communication Review , Proceedings of the ACM SIGCOMM '98 conference on Applications, technologies, architectures, and protocols for computer communication**, Volume 28 Issue 4

Full text available:  [pdf\(1.79 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)



The rapid growth of the World Wide Web has caused serious performance degradation on the Internet. This paper offers an end-to-end approach to improving Web performance by collectively examining the Web components --- clients, proxies, servers, and the network. Our goal is to reduce user-perceived latency and the number of TCP connections, improve cache coherency and cache replacement, and enable prefetching of resources that are likely to be accessed in the near future. In our scheme, server re ...

Keywords: Web, caching, coherency, filters, piggybacking, prefetching, volumes

7 AMTree: an active approach to multicasting in mobile networks

Kwan-Wu Chin, Mohan Kumar

August 2001 **Mobile Networks and Applications**, Volume 6 Issue 4

Full text available:  [pdf\(250.85 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)



Active networks (ANs) are a new paradigm in computer networking. In ANs, programs can be injected into routers and switches to extend the functionalities of the network. This allows programmers to enhance existing protocols and enables the rapid deployment of new protocols. Little work has been done in the area of multicast routing in heterogeneous environments. In this paper, we propose AMTree, an AN-based multicast tree that is bidirectional, optimizable on demand and adaptive to source mi ...

Keywords: active networks, mobile/wireless networks, multicast

8 Fast and scalable layer four switching

V. Srinivasan, G. Varghese, S. Suri, M. Waldvogel

October 1998 **ACM SIGCOMM Computer Communication Review , Proceedings of the ACM SIGCOMM '98 conference on Applications, technologies, architectures, and protocols for computer communication**, Volume 28 Issue 4Full text available:  [pdf\(1.76 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In Layer Four switching, the route and resources allocated to a packet are determined by the destination address as well as other header fields of the packet such as source address, TCP and UDP port numbers. Layer Four switching unifies firewall processing, RSVP style resource reservation filters, QoS Routing, and normal unicast and multicast forwarding into a single framework. In this framework, the forwarding database of a router consists of a potentially large number of filters on key header ...

9 Special issue: AI in engineering

D. Sriram, R. Joobbani

January 1985 **ACM SIGART Bulletin**, Issue 91Full text available:  [pdf\(8.79 MB\)](#)Additional Information: [full citation](#), [abstract](#)

The papers in this special issue were compiled from responses to the announcement in the July 1984 issue of the SIGART newsletter and notices posted over the ARPAnet. The interest being shown in this area is reflected in the sixty papers received from over six countries. About half the papers were received over the computer network.

10 Structuring computer-mediated communication systems to avoid information overload

Starr R. Hiltz, Murray Turoff

July 1985 **Communications of the ACM**, Volume 28 Issue 7Full text available:  [pdf\(1.63 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Unless computer-mediated communication systems are structured, users will be overloaded with information. But structure should be imposed by individuals and user groups according to their needs and abilities, rather than through general software features.

11 Garbage collecting the Internet: a survey of distributed garbage collection

Saleh E. Abdullahi, Graem A. Ringwood

September 1998 **ACM Computing Surveys (CSUR)**, Volume 30 Issue 3Full text available:  [pdf\(337.65 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Internet programming languages such as Java present new challenges to garbage-collection design. The spectrum of garbage-collection schema for linked structures distributed over a network are reviewed here. Distributed garbage collectors are classified first because they evolved from single-address-space collectors. This taxonomy is used as a framework to explore distribution issues: locality of action, communication overhead and indeterministic communication latency.

Keywords: automatic storage reclamation, distributed, distributed file systems, distributed memories, distributed object-oriented management, memory management, network communication, object-oriented databases, reference counting

12**Router plugins: a software architecture for next-generation routers**

Dan Decasper, Zubin Dittia, Guru Parulkar, Bernhard Plattner
 February 2000 **IEEE/ACM Transactions on Networking (TON)**, Volume 8 Issue 1

Full text available:  [pdf\(530.34 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: communication system routing, communication system security, internet, modular computer systems

13 "Topologies"—distributed objects on multicomputers 

Karsten Schwan, Win Bo
 May 1990 **ACM Transactions on Computer Systems (TOCS)**, Volume 8 Issue 2

Full text available:  [pdf\(3.83 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Application programs written for large-scale multicomputers with interconnection structures known to the programmer (e.g., hypercubes or meshes) use complex communication structures for connecting the applications' parallel tasks. Such structures implement a wide variety of functions, including the exchange of data or control information relevant to the task computations and/or the communications required for task synchronization, message forwarding/filtering under program control, and so on ...

14 Experiences with network-based user agents for mobile applications 

Thomas F. La Porta, Thomas Woo, Krishan K. Sabnani, Ramachandran Ramjee
 August 1998 **Mobile Networks and Applications**, Volume 3 Issue 2

Full text available:  [pdf\(631.57 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Wireless networks are characterized by simple end devices and limited bandwidth. One solution to address these and other limitations of the wireless mobile environment that has been widely pursued is the placement of proxies, or agents, inside the network to assist with application processing that would normally take place on end devices. These agents can additionally manipulate data to reduce bandwidth requirements and assist in providing services. The design and implementation of a user agent ...

15 Router plugins: a software architecture for next generation routers 

Dan Decasper, Zubin Dittia, Guru Parulkar, Bernhard Plattner
 October 1998 **ACM SIGCOMM Computer Communication Review , Proceedings of the ACM SIGCOMM '98 conference on Applications, technologies, architectures, and protocols for computer communication**, Volume 28 Issue 4

Full text available:  [pdf\(1.82 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Present day routers typically employ monolithic operating systems which are not easily upgradable and extensible. With the rapid rate of protocol development it is becoming increasingly important to dynamically upgrade router software in an incremental fashion. We have designed and implemented a high performance, modular, extended integrated services router software architecture in the NetBSD operating system kernel. This architecture allows code modules, called *plugins*, to be dynamically ...

Keywords: high performance integrated services routing, modular router architecture, router plugins

16 Relational profiling: enabling thread-level parallelism in virtual machines 

Timothy Heil, James E. Smith

December 2000 **Proceedings of the 33rd annual ACM/IEEE international symposium on Microarchitecture**

Full text available:  [pdf\(237.19 KB\)](#)

 [ps\(1.61 MB\)](#) 

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17 OceanStore: an architecture for global-scale persistent storage

John Kubiatowicz, David Bindel, Yan Chen, Steven Czerwinski, Patrick Eaton, Dennis Geels, Ramakrishna Gummadi, Sean Rhea, Hakim Weatherspoon, Chris Wells, Ben Zhao

November 2000 **Proceedings of the ninth international conference on Architectural support for programming languages and operating systems**, Volume 28, 34 Issue 5 , 5

Full text available:  [pdf\(166.53 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

OceanStore is a utility infrastructure designed to span the globe and provide continuous access to persistent information. Since this infrastructure is comprised of untrusted servers, data is protected through redundancy and cryptographic techniques. To improve performance, data is allowed to be cached anywhere, anytime. Additionally, monitoring of usage patterns allows adaptation to regional outages and denial of service attacks; monitoring also enhances performance through pro-active movement ...



18 OceanStore: an architecture for global-scale persistent storage

John Kubiatowicz, David Bindel, Yan Chen, Steven Czerwinski, Patrick Eaton, Dennis Geels, Ramakrishnan Gummadi, Sean Rhea, Hakim Weatherspoon, Westley Weimer, Chris Wells, Ben Zhao

November 2000 **ACM SIGPLAN Notices**, Volume 35 Issue 11

Full text available:  [pdf\(1.47 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

OceanStore is a utility infrastructure designed to span the globe and provide continuous access to persistent information. Since this infrastructure is comprised of untrusted servers, data is protected through redundancy and cryptographic techniques. To improve performance, data is allowed to be cached anywhere, anytime. Additionally, monitoring of usage patterns allows adaptation to regional outages and denial of service attacks; monitoring also enhances performance through pro-active movement ...



19 Efficient communication in a design environment

Idalina Videira, Paulo Veríssimo, Helena Sarmento

June 1996 **Proceedings of the 33rd annual conference on Design automation**

Full text available:  [pdf\(55.24 KB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)



20 The architecture and performance of security protocols in the ensemble group communication system: Using diamonds to guard the castle

August 2001 **ACM Transactions on Information and System Security (TISSEC)**, Volume 4 Issue 3

Full text available:  [pdf\(418.73 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Ensemble is a Group Communication System built at Cornell and the Hebrew universities. It allows processes to create *process groups* within which scalable reliable fifo-ordered multicast and point-to-point communication are supported. The system also supports other communication properties, such as causal and total multicast ordering, flow control, and the like. This article describes the security protocols and infrastructure of Ensemble.

Applications using Ensemble with the extensions des ...

Keywords: Group communication, security

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